

ZHENGFEI SONG

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Education

Tongji University, College of Electronic and Information Engineering **2021.09 – Present**
B.E in Automation, GPA: 91.71/100 *Shanghai, China*

A+ Courses: Artificial Intelligence Basics, Optimization principles and methods, Embedded Systems, Machine Learning and Data Processing, Game Theory, Python Programming, Comprehensive Design and Practice A, etc.

The Hong Kong Polytechnic University, Department of EEE **2024.09 – 2024.12**
Exchange student of BEng(Hons) in Electrical Engineering, GPA: 4.3/4.3 *HongKong, China*

Publication

Nachuan Ma, **Zhengfei Song**, Qiang Hu, Chuang-Wei Liu, Yu Han, Yanting Zhang, Rui Fan, Lihua Xie, 'Vehicular Road Crack Detection with Deep Learning: A New Online Benchmark for Comprehensive Evaluation of Existing Algorithms', *IEEE Transactions on Intelligent Vehicles* (JCR: Q1, IF: 14, under review).[\[arxiv\]](#)

Research Experience

Machine Visual Perception Based on Semantic Segmentation **2023.10 – Present**
RA in Machine Intelligence and Autonomous System(MIAS) Group, Supervisor: Prof. Rui Fan *Tongji University*

- Conducted a **comprehensive survey for deep learning-based vehicular road crack detection** and proposed a new online benchmark. Responsible for **experiments at pixel level on Transformer-based algorithms**, dataset production and data visualization.
- Proposed a novel **lightweight network LR-CrackNet** for real-time road crack detection, which **achieves SoTA detection performance** on public datasets and surpasses public algorithms in processing efficiency.
- Completed some **model replication projects**, such as Harris Corner Detection, Stereo Matching, Handwritten Digit Recognition, SNE(Surface Normal Estimator) Road-Seg, RAFT-Stereo, etc.

AeroEye: Snake-like Robot System for Aircraft Engine Damage Detection **2023.02 – 2024.03**
Key Member of the Project, Supervisor: Prof. Peng Qi *Tongji University*

- Responsible for **robot perception via deep learning**; used YOLOv5s to **perform real-time flaw detection at bounding-box level**; Designed an obstacle avoidance system based on robot visual perception; Participated in the configuration design of the snake-like robot with high degree of freedom.
- Two invention patents** applied for as the first student-author are in the substantive examination stage.
- Selected for a poster presentation at the *National Undergraduate Innovation Conference*; Featured in China Media Group CGTN's annual documentary *China: Race to the Future*.

Projects

Gesture Recognition based on STM32G0 and 16 Infrared Sensors [\[code\]](#)
Embedded System Development of Handwritten Digit Recognition [\[code\]](#)

Selected Honors and Awards

Grand Prize, HUAWEI ICT (Information and Communications Technology) Competition Global Final (*top 0.03%, part of the Flagship Projects of Key Partners of the UNESCO Global Skills Academy*) **2024.05**
Gold Award, China International College Students' Innovation Competition (*Shanghai Division*) **2024.07**
First Prize, HUAWEI CUP National Undergraduate IOT Design Contest (*East China Division*) **2023.08**
Honorable Mention, 2023 Interdisciplinary Contest In Modeling **2023.05**
The distinguished B. E. academic scholarship (*top 5% undergraduate students in each major of Tongji University*) for three consecutive years; Student International and Overseas Exchange Scholarship **2021-2024**
Selected for the **1st QiDi Class** of QiDi Program at Tongji University (*supported by Qidi Wu, the former Deputy Minister of Education of China and former President of Tongji University*) **2022**

Miscellaneous

Programming Languages: Python, C/C++, LaTeX, MATLAB.

Tech Skills: Pytorch, OpenCV, EDA, Tina, Adobe Illustrator.

Language: TOEFL: 100 (R 26, L 28, S 22, W 24), CET6: 590.

Research Interests: Computer Vision, Robot Perception, Deep Learning, Machine Intelligence.